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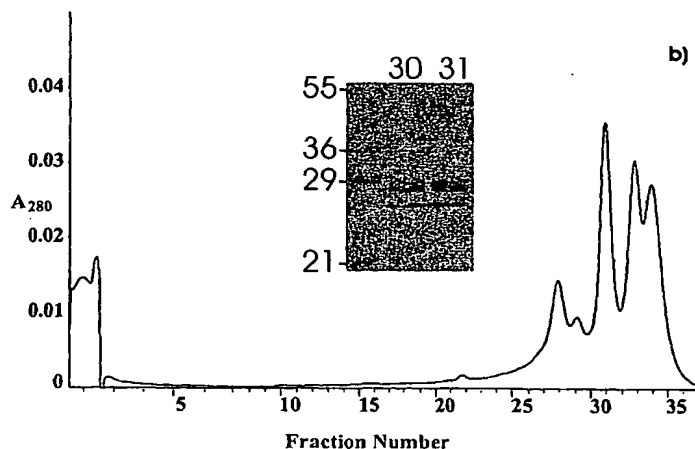
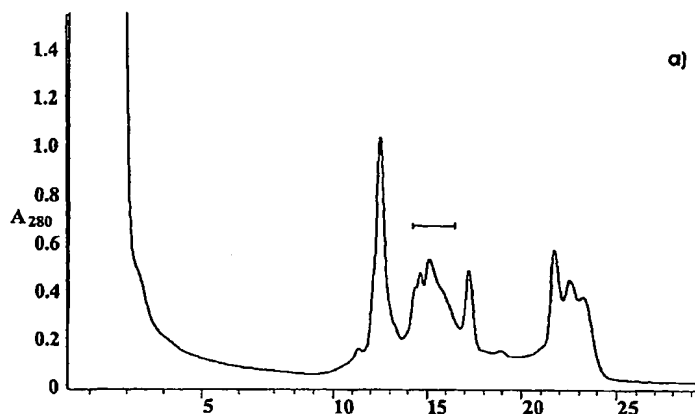
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[Continued on next page]

(54) Title: **CAMPYLOBACTER GLYCANS AND GLYCOPEPTIDES**



(57) Abstract: Multiple strains and species of Campylobacter were found to share a common glycan moiety which is present in a plurality of surface-exposed glycoproteins. This glycan has the formula: GalNAc- $\alpha$ 1,4-GalNAc- $\alpha$ 1,4-[Glc- $\beta$ 1,3]GalNAc- $\alpha$ 1,4-GalNAc- $\alpha$ 1,4-GalNAc- $\alpha$ 1,3-Bac, wherein Bac is 2,4-diacetamido-2,4,6-trideoxy-D-glucopyranose. This glycan and immunologically active fragments of it have use as vaccines against campylobacter infection in humans and animals. As well, antibodies which specifically bind these compounds may be provided. Such antibodies and vaccines may be used to prevent or neutralize campylobacter infections in livestock thereby preventing this pathogen from entering the human food chain. The glycan may be linked to one or more amino acids to form a glycopeptide. As well, a method for determining the glycan structure of an intact glycoprotein consists of subjecting a sample to high resolution magic angle spinning nuclear magnetic resonance (HR-MAS-NMR) spectroscopy.



GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/C. 03/01156

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07H3/06 C08B37/00 G01N33/569 C12N5/04 :12N15/10  
A61K39/106 A61P31/04 C07K16/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C07H C08B G01N C12N A61K A61P C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SCHWERER B ET AL: "ANTIBODY CROSS-REACTIVITIES BETWEEN GANGLIOSIDES AND LIPOPOLYSACCHARIDES OF CAMPYLOBACTER JEJUNI SEROTYPES ASSOCIATED WITH GUILLAIN-BARRE SYNDROME" JOURNAL OF ENDOTOXIN RESEARCH, CHURCHILL LIVINGSTONE, EDINBURGH, GB, vol. 2, no. 6, December 1995 (1995-12), pages 395-403, XP000982768 ISSN: 0968-0519 the whole document	1,11,17
A	WO 95/05850 A (ENTERIC RES LAB INC) 2 March 1995 (1995-03-02) claims	1,11,17
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☒ Further documents are listed in the continuation of box C.

☒ Parent family members are listed in annex.

### \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same parent family

Date of the actual completion of the international search

21 January 2004

Date of mailing of the international search report

19 Jan 2004

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 03/01156

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	D. LINTON ET AL.: "Identification of N-acetylgalactosamine-containing glycoproteins PEB3 and CgpA in Campylobacter jejuni" MOLECULAR MICROBIOLOGY, vol. 43, 2002, pages 497-508, XP002267530 the whole document	1
P,X	----- N.M. YOUNG ET AL.: "Structure of the N-linked glycan present on multiple glycoproteins in the gram-negative bacterium, Campylobacter jejuni" J. BIOL. CHEM., vol. 277, no. 45, 2002, pages 42530-42539, XP002267531 the whole document -----	1-5,7-32

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/CA 03/01156

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
  
Although claims 17-21 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-5, 7-32

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-5, 7-32

A glycan and compositions, uses, antibody, methods, feed, genome, cell, plant and kits pertaining thereto.

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2. claim: 6

A method of detecting a glycan moiety of a bacterial glycoprotein.

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**Information on patent family members**

PCT/CA 03/01156

Form PCT/ISA/210 (patent family annex) (January 2004)